

PTO/SB/21 (6-98) (modified)
Approved for use through 09/30/00. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Stion Number 10/046,926

	Application Number	10/046,926
	Filing Date	1/13/02
	First Named Inventor	Steven Teig
l filing)	Group Art Unit	<none yet=""></none>
	Examiner Name	<none yet=""></none>
*	Attorney Docket Number	SPLX.P0085
	filing) *	Filing Date First Named Inventor Group Art Unit Examiner Name

	Enclosures (Check all that appl	у)		
Fee Transmittal Form	Assignment Papers (for an application)	After Allowance Communication to Group		
Fee Attached	Drawing(s)	Appeal Communication to Board of Appeals and Interferences		
Amendment/Reply	Licensing-related Papers	Appeal Communication to Group		
After Final	Petition	Proprietary Information		
Affidavits/declarations(s)	Petition to Convert a Provisional Application	Status Letter		
Preliminary Amendment				
Extension of Time Request	Power of Attorney, Revocation Change of Correspondence Address	Other Enclosures (Listed below):		
Request to Rescind Previous Non-Publication Request	Terminal Disclaimer	Postcard 87-References		
Information Disclosure Statement and PTO-1449	Request for Refund	RECEIVED APR 29 2003 ECHNOLOGY CENTER		
Certified Copy of Priority Documents	Remarks:	APR :		
Response to Missing Parts/ Incomplete Application)EIVI		
Response to Missing Parts under 37 CFR 1.52 or 1.53		ED 2003 NTER 26		
sidn	ATURE OF APPLICANT, ATTORNEY,	DR AGENT 28		
Firm <i>Or</i> Individual name Man	Adeli, Reg. No. 39,585 of Stattler Joh	ansen & Adeli LLP		
Signature				
Date Ap 12	3 2003			
	CERTIFICATE OF MAILIN	G		
I hereby certify that this corresponde envelope addressed to: Assistant Co	nge is being deposited with the United States in missioner for Patents, Washington, D.C. 20	Postal Services as first class mail in an 1231 on this date: 4/23/03		
Typed or printed name Man A				
Signature	ALLM	Date April 23, 2003		
· /\	11 17 00 1	•		

PATENT Docket No. SPLX.P0085

CERTIFICATE OF MAILING BY "FIRST CLASS MAIL".

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: .

Assistant Commissioner for Patents, Washington, D.C. 2021, quaptil 33, 2003.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Steven Teig

Serial No.:

10/046,926

Filing Date:

1/13/02

For:

ROUTING METHOD AND

APPARATUS

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97

Assistant Commissioner for Patents Washington, D.C. 20231

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO-1449. Copies of the documents are also submitted herewith. The Examiner is requested to make these documents of record. Applicants would appreciate the Examiner initialing and returning the Form PTO-1449, indicating that the information has been considered and made of record herein.

This Information Disclosure Statement is submitted within three months of the application filing date or before the mailing date of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

This Information Disclosure Statement under 37 C.F.R. § 1.97 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-1128** referencing SPLX.P0085. However, the Assistant Commissioner is not authorized to charge the cost of the issue-fee to the Deposit Account.

Dated: April 23, 2003

Respectfully suff

tion No. 39,585

Stattler, Johansen & Adeli LLP P.O. Box 51860

Palo Alto, CA 94303-0728

Phone No. (650) 752-0990 x102

Fax No. (650) 752-0995

м	+	

	PF	1				
\ 0\	C.	Substitute for form 1	449A/F	PTO	Application Number	10/046,926
	1 8 2003 INFORMATION DISCLOSURE STATEMENT BY APPLICANT		OCUPE	Filing Date	1/13/02	
o APR	SWA.	TEMENT RY	30LI Appi	USUKE ICANT	First Named Inventor	Steven Teig
ERRY & I	, age	TEMENT DI	~! ! L		Group Art Unit	
V &	TRADEM (U	se as many sheets a	is nece:	ssary)	Examiner Name	
	Sheet	1 .	of	1	Attorney Docket Number	SPLX.P0085

				U.S. PATENT DOCUMENT	S	
Examiner* Initials	Cite No.1		cument nd Code ² if known)	Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2001/ 0003843	A1	Scepanovic et al.	06-14-01	
	2.	4,615,011		Linsker	09-30-86	
	3.	4,673,966		Shimoyama	06-16-87	
	4.	4,782,193		Linsker	11-01-88	
	5.	4,855,929		Nakajima	08-08-89	
	6.	5,097,422		Corbin II et al.	03-17-92	
	7.	5,251,147		Finnerty	10-05-93	
	8.	5,281,151		Arima et al.	01-25-94	
	9	5,360,948		Thornberg	11-01-94	
	10.	5,375,069	-	Satoh et al.	12-20-94	
	11.	5,532,934		Rostoker	07-02-96	
	12.	5,578,840		Scepanovic	11-26-96	
	13.	5,633,479		Hirano	05-27-97	
•	14.	5,634,093		Ashida et al.	05-27-97	
	15.	5,636,125		Rostoker et al.	06-03-97	•
	16.	5,650,653		Rostoker et al.	07-22-97	
	17.	5,657,242		Sekiyama et al.	08-12-97	
	18.	5,723,908		Fuchida et al.	03-03-98	
	19.	5,742,086		Rostoker et al.	04-21-98	
	20.	5,757,656		Hershberger et al.	05-26-98	
	21.	5,777,360		Rostoker et al.	07-07-98	
	22.	5,811,863		Rostoker et al.	09-22-98	
	23.	5,822,214		Rostoker et al.	. 10-13-98	
	24.	5,859,449		Kobayashi et al.	01-12-99	,
	25.	5,898,597		Scepanovic et al.	04-27-99	

Examiner	Date	
Signature	Considered	

^{*} EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

6	PleaseEvpe a plus	sign (+) inside this box	тм +			PTO/SB/08A (08-00) - MODIFIED Approved for use through 10/31/2002. OMB 0651-0031 ademark Office: U.S. DEPARTMENT OF COMMERCE
ſ	Pine -	dubstitute for form	1449A/F	то	Application Number	10/046,926
4	PR 2 8 2003			001105	Filing Date	1/13/02
8	INFQ STA	RMATION DI	APDI	USURE ICANT	First Named Inventor	Steven Teig
*	MADEMAR	TEMENT BY	~! ! L		Group Art Unit	
	(u	ise as many sheets a	as nece:	ssary)	Examiner Name	
	Sheet	2	of	2	Attorney Docket Number	SPLX.P0085

			U.S. PATENT DOCUMENTS	
26.	5,914,887		Scepanovic et al.	06-22-99
27.	5,973,376		Rostoker et al.	10-26-99
28.	6,035,108		Kikuchi	03-07-00
29.	6,058,254		Scepanovic et al.	05-02-00
30.	6,067,409		Scepanovic et al.	05-23-00
31.	6,068,662		Scepanovic et al.	05-30-00
32.	6,123,736		Pavisic et al.	09-26-00
33.	6,134,702		Scepanovic et al.	10-17-00
34.	6,155,725		Scepanovic et al.	12-05-00
35.	6,175,950	B1	Scepanovic	01-16-01
36.	6,216,252	B1	Dangelo et al.	04-10-01
37.	6,230,306	B1	Raspopovic et al.	05-08-01
38.	6,247,167	B1	Raspopovic et al.	06-12-01
39.	6,260,179	B1	Ohsawa et al.	07-10-01
40.	6,262,487	B1	lgarashi et al.	07-17-01
41.	6,289,495	B1	Raspopovic	09-11-01
42.	6,301,686	B1	Kikuchi et al.	10-09-01
43.	6,327,694	B1	Kanazawa	12-04-01
44.	6,378,121	B2	Hiraga	04-23-02
45.	6,385,758	B1	Kikuchi et al.	05-07-02
46.	6,401,234	B1	Alpert et al.	06-04-02
47.	6,405,358	B1	Nuber	06-11-02
48.	6,412,097	B1	Kikuchi et al.	06-25-02
49.	6,412,102	B1	Andreev et al.	06-25-02
50.	6,436,804	B2	Igarashi et al.	08-20-02
51.	6,446,245	B1	Xing et al.	09-03-02
52.	6,516,455	B1	Teig et al.	02-04-03

Examiner	Date
	. 50.0
Signature	Considered
Cignataro	Considered

^{*} EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

1	Please type a plus	sign (+) inside this box	тм [+			opproved for use through 10/31/2002. OMB 0651-0031 demark Office: U.S. DEPARTMENT OF COMMERCE
	mrs il	Substitute for form	1449A/F	то	Application Number	10/046,926
194	2 8 2013 3	DMATION D	1001	OCUDE	Filing Date	1/13/02
	SS A	RMATION DI	APPI APPI	USURE ICANT	First Named Inventor	Steven Teig
4	TRADEMA		A		Group Art Unit	
		ise as many sheets a			Examiner Name	
	Sheet	3	of	3	Attorney Docket Number	SPLX.P0085

			U.S. PATENT D	OCUMENTS	
53.	6,516,455	B1	Teig et al.	02-04-03	
54.	2003/0025 205	A1	Shively	02-06-03	

					FOREIGN PATENT DOCUMEN	ITS		
Examiner* Initials	Cite No.1	For Office ³	reign Patent Do Number⁴	cument Kind Code (if known)⁵	Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
	55.	JP	64-15947		Ouchi	01-19-89		
	56.	JP	04000677		Fujiwara et al.	01-1992		

Examiner	Date	
Signature	Considered ·	

^{*} EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

Please type a plus	sign (+) inside this box	тм +		Approved for use through 10/31/2002. OMB 0651-003 Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE		
Cil	Substitute for form	1449A/F	то	Application Number	10/046,926	
APR 2 8 2003	DMATION D	1001	201125	Filing Date	1/13/02	
1 11412	RMATION DI			First Named Inventor	Steven Teig	
PADEMARK	ILMENT DI	~! ! L		Group Art Unit		
(L	use as many sheets a	as nece:	ssary)	Examiner Name		
Sheet	4	of	. 4	Attorney Docket Number	SPLX.P0085	

		OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	
Examiner* Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Т
	57.	A.H. Farrahi, et al., Quality of EDA CAD Tools: Definitions, Metrics and Directions, Quality Electronic Design, 2000, Proceedings of the first International Symposium on March 2000, pp 395-405.	
	58.	A. Vannelli, et al., An adaptation of the interior point method for solving the global routing problem, 2/1991, IEEE pp 193-203.	
	59.	B. Berger, et al., Nearly Optimal Algorithms and Bounds for Multilayer Channel Routing, Journal of the Association for Computing Machinery, pp. 500-542, March 1995.	
	60.	C. Chiang, et al., Wirability of Knock-Knee Layouts with 45° Wires, IEEE Transactions on Circuits and Systems, Vol. 38, Issue 6, pp 613-624, June 1991.	
	61.	G. Overtone, EDA Underwriter 2 Finding Space in a Multi Layer Board, Electronic Engineering, Morgan-Grampian LTD, vol. 67, No. 819, pp 29-30.	
	62.	G.D. Hachtel et al., Linear Complexity Algorithms for Hierarchical Routing, 1/89, IEEE pp 64-80.	
	63.	J.D. Cho, et al., Four-Bend Top Down Global Routing, IEEE, pp 793-802, 1998.	
-	64.	J. Su et al., Post Route Optimization for Improved Yield Using Rubber-Band Wiring Model, 1997 International Conference on Computer-Aided Design, pp 700-706, November 1997.	
	65.	J. Vicente, RSR: A New Rectilinear Steiner Minimum Tree Approximation for FPGA Placement and Global Routing, Proceedings of the 24 th Euro Micro Conference, pp 192-195, August 1998.	
	66.	K. Powers et al., The 60° Grid. Routing Channels in Width d/square root 3, VLSI, 1991, Proceedings., First Great Lakes Symposium on Kalamazoo, MI, USA, pp 214-291, March 1991.	
	67.	M. Alexander et al., Performance-Oriented Placement and Routing for field-programmable gate arrays, Proceedings of the European Design Automation Conference, pp 80-85, 1995.	
	68.	M. Alexander et al., Placement and Routing for Performance-Oriented FPGA Layout, VLSI Design, Vol. 7, No. 1, 1998.	
	69.	M. Igarashi et al., A Diagonal-Interconnect Architecture and Its Application to RISC Core Design, 2002 IEEE Solid-Sate Circuits Conference, pp 210-460, February 2002.	
	70.	P. Dood, et al., A Two-Dimensional Topological Compactor with Octagonal Geometry, 28 th ACM/IEEE Design Automation Conference, pp 727-731, July 1991	
	71.	P. Parakh, et al., Congestion Driven Quadratic Placement, Proceedings of Design Automation Conference, 1998, pp 275-278.	-
	72.	R. Putatunda et al., VITAL: Fully Automatic Placement Strategies for Very Large Semicustom Designs, Proceedings of the International Conference on Computer Design: VLSI in Computers and Processors, pp 434-439 October 1988.	

Examiner		Date	
Signature	·	Considered	

^{*} EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

EM	+	

	Substitute for form 1	449A/P	то	Application Number	10/046,926
2)50	DMATION DI	001	OCUDE.	Filing Date	1/13/02
RIFORMATION DISCLOSURE				First Named Inventor	Steven Teig
The Service of All Property				Group Art Unit	
.87	se as many sheets a	s neces	ssary)	Examiner Name	
RADEneet	5	of	5	Attorney Docket Number	SPLX.P0085

	OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS
73.	S. Dutt, et al., Probability-Based Approaches to VLSI Circuit Partitioning, IEEE Trans. On Computer Aided Design of IC's and Systems, Vol. 19, No. 5, May 2000, pp 534-549.
74.	Y. Sekiyama et al., Timing-Oriented Routers for PCB Layout Design of High-Performance Computers, International Conference on Computer Aided Design, pp 332-335, November 1991.
75.	C. Leiserson et al., Algorithm for Routing and Testing Routability of Planar VLSI Layouts, pp 69-78, May 1985.
76.	S. Das et a., Channel Routing in Manhattan-Diagonal Model, 9 th International Conference on VLSI Design, January 1996. pp 43-48.
77.	W. Wei-Ming Dai et a., Routability of a Rubber-Band Sketch. 28 th ACM/IEEE Design Automation Conference, 1991. pp 45-65.
78.	H. Chen, Routing L-Shaped Channels in Nonslicing-Structure Placement. 24 th ACM/IEEE Design Automation Conference, pp 152-165, 1987.
. 79.	I. Tollis, Techniques for Wiring in Non-Square Grids, pp 66-69. May 1989.
80.	E. Lodi et al., A 2d Channel Router for the Diagonal Model, pp 111-125, April 1991.
81.	E. Lodi et al., Routing in Times Square Mode, pp 41-48, June 1990.
82.	K. Cheng-Kok et al., Manhattan or Non Manhattan? A Study of Alternative VLSI Routing Architectures. pp 47-52, 2000
83.	E. Lodi et al., Routing Multiterminal Nets in a Diagonal Model, pp 899-902, 1988.
84.	D. Staepelaere et al., Surf: A Rubber-Band Routing System for Multichip Modules. pp 18-26, 1993.
85.	S. Das et al., Routing of L-Shaped Channels, Switch boxes and Staircases in Manhattan-Diagonal Model, pp 65-70m January 1998.
86.	W. Schiele et al., A Gridless Router for Industrial Design Rule, 27 th ACM/IEEE Design Automation Conference, pp 626-631, 1990.
87.	J. Nester, A New Look at Hardware Maze Routing, Proceedings of the 12 th ACM Symposium on Great Lakes Symposium on VLSI, pp 142-147, April 2002.

	-		
Examiner		Date	
Signature		Considered	
			A

^{*} EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.